User guide

(standard guide or Ultimate models)

HDTS trampoline measurement system (Art.-Nr. HDTS01)

General information

Information in this guide is subject to change without notice.

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September, 2021

European Patent-Nr.: 2962736.

About this Manual

HDTS is a measurement system for competitive trampolining. This manual describes the HDTS01 model.

The first part of this manual describes how to install and set up your system, and verify that the system is working properly.

The second part of this manual describes the features and capabilities of your system using the QIRA-software. Troubleshooting information is also provided.

Intended Audience

This document is intended for Judges, Officials, Coaches, Athletes or other responsible for using the HDTS01-measurement system.

Conventions Used in this Manual

Paragraphs with important additional information are marked with „**NOTE**“.

Paragraphs explaining optional features are marked with „**OPTIONAL**“.

Computer Requirements

- Windows 10 or newer
- USB port
- Screen resolution 1920 x 1080 pixels (or higher)
- Microsoft Visual C++ 2015-2019 Redistributable (ships with the software)
- Administrator privileges to **install** the Qira software

Glossary

- **ToF**: Time of Flight
- **HD**: Horizontal Displacement
- **SYN**: Synchronicity
- **IM:** Individual Mode
- **SM**: Synchronized Mode
- **FP**: Force Plate
- **USB-Box**: USB-Master

General data

Art.-No. HDTS01: HDTS trampoline measurement system

- FIG approved
- Standard for Eurotramp Ultimate models (Adapter for other models available)
- If the trampoline is not from Eurotramp, a stability plate adaptor can be purchased.
- This user guide is written for Qira V2.1.x. Some features may be similar in other versions. The most recent Qira software can always be downloaded from the Eurotramp website, under the following link: https://www.eurotramp.com/en/products/hdts/downloads

Maintenance recommendations

- Be cautious when moving and operating.
- Keep system dry and clean.
- Prevent system from shocks and hits.
- Prevent system from extreme heat or cold.
- Recommendation: Transport in padded box or similar.

Parts list (scope of delivery)

Art.-Nr. HDTS01: HDTS trampoline measurement system	Quantity
1. USB-Master Box	1
2. Silver cable (connects the USB-Master Box to the PC)	2
3. USB flash drive with PC software	1
4. Measuring plates HDTS fort wo trampolines (4 measuring plates per trampoline)	8
5. Green cables (ethernet cables for connecting measuring plates 2 and 3)	2
6. Blue cables (ethernet cables for connecting measuring plates 1 and 2, 3 and 4 respectively)	4
7. grey cable (ethernet cable for connecting the USB Master Box with measuring plate 1)	2

Shown here: HDTS parts for 1 trampoline.

All spare parts available from Eurotramp upon request.

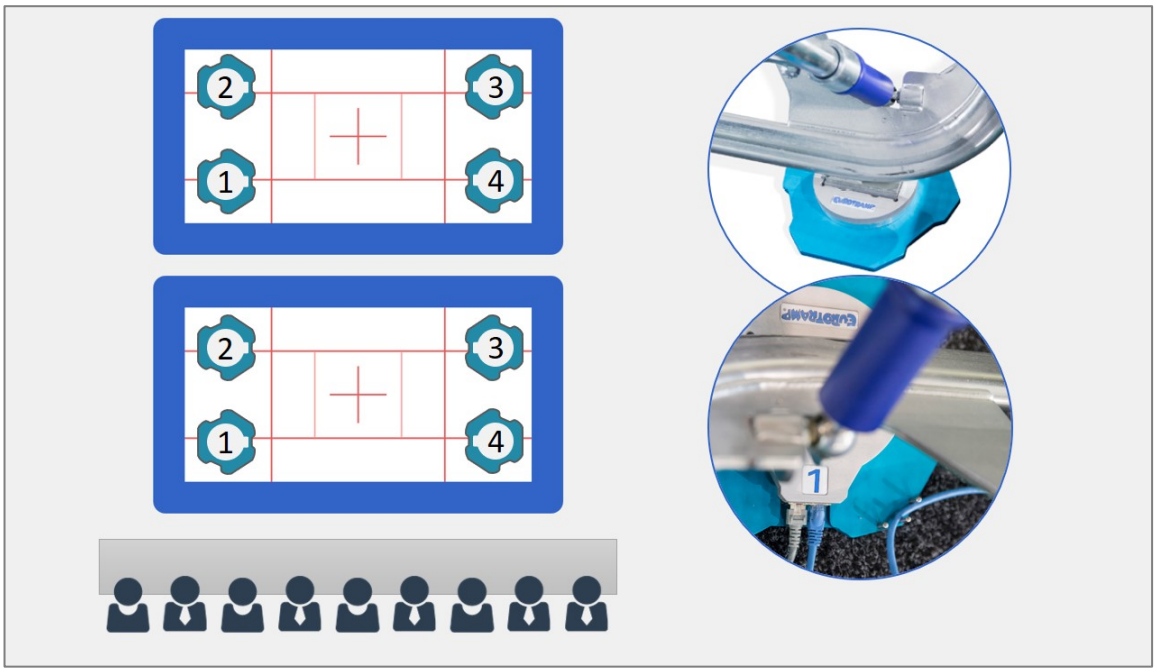
The very highest demands are placed on this high-end-product. For safety reasons, only use original replacement parts! The use of non-original replacement parts can result in considerable risk to the user (danger of accidents, technical defects, loss of the manufacturer's liability, loss of warranty etc.).

User guide

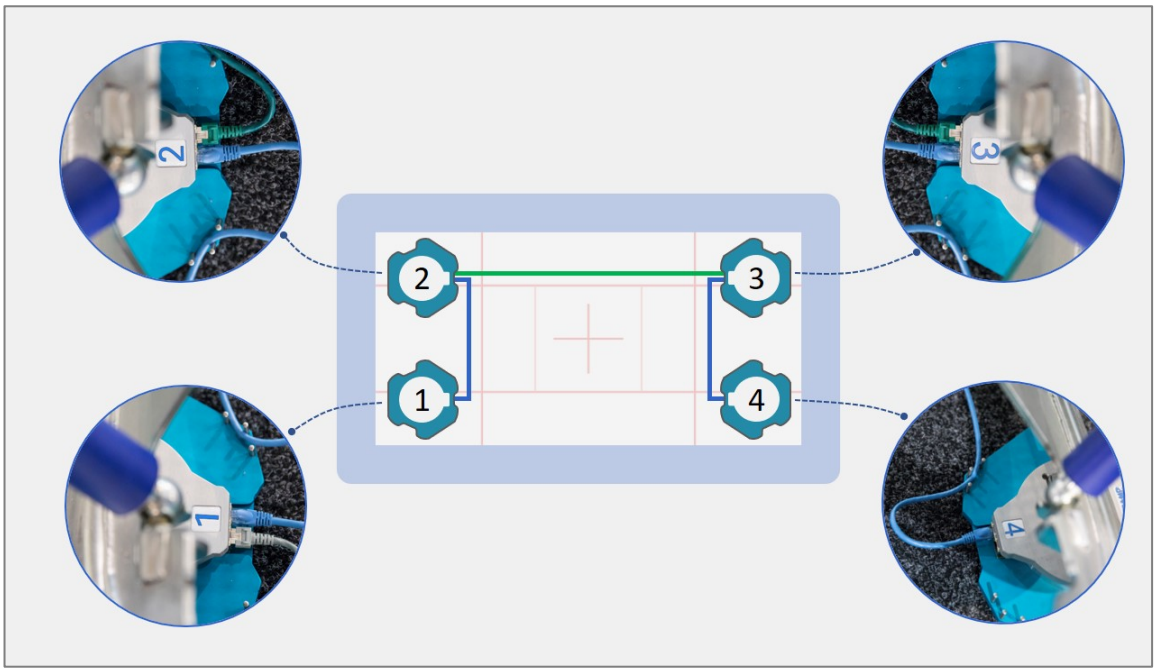
1 Setup instructions

Start by setting up the trampolines. Place the force plates under the trampoline as shown in the picture. Ensure the correct numbering of the plates: the plate labeled with number 1 is in the left corner close to the judges' table. The other plates are positioned clockwise around the trampoline. Use only correct adapters depending on the trampoline (either Ultimate or Premium).

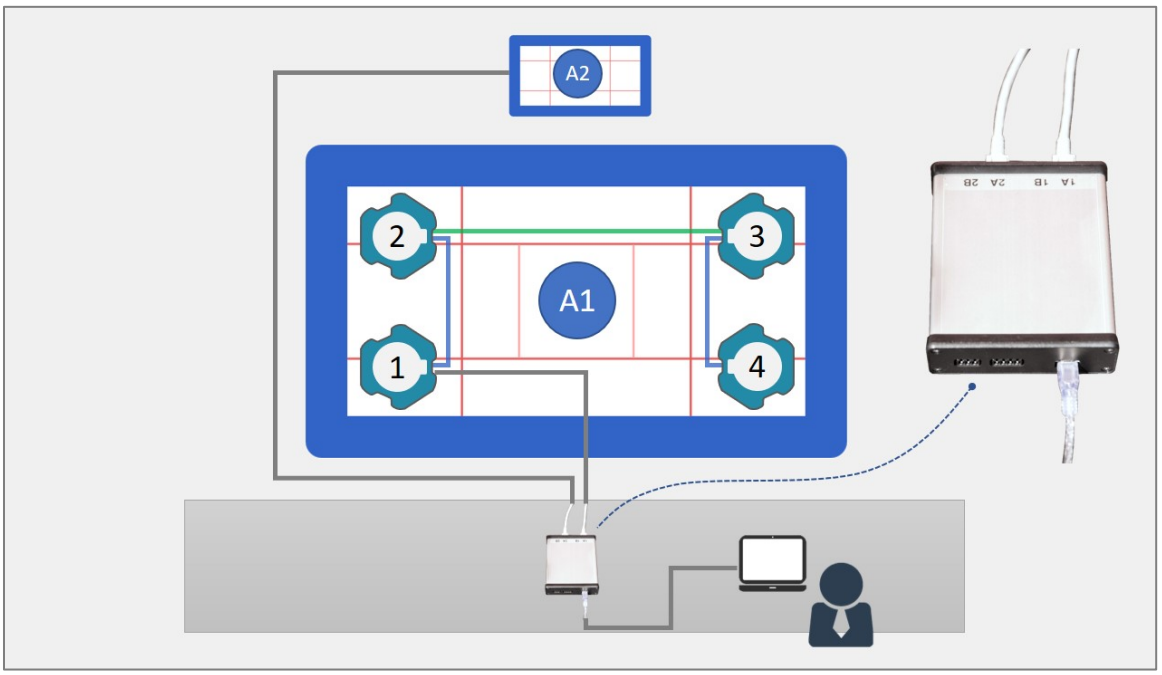
The cable ports face inward.



Connect force plates 1 and 2 (3 and 4 respectively) with a blue ethernet cable using the inner ports. Connect force plates 2 and 3 with a green ethernet cable using the outer ports. Make sure to lead the cables around the pins as shown in the picture to prevent damage.



Connect force plate 1 (outer port) with a long ethernet cable (max. 30m) to the USB box. The trampoline facing the judges is using port 1, the second trampoline is connected to port 2. Connect the USB box with the laptop using the USB cable.

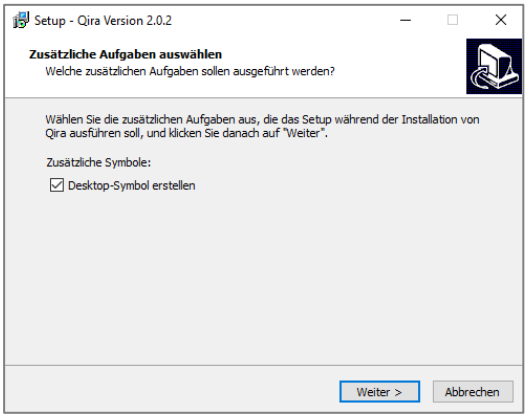


Note:

- Install the cables under butt connectors (trip hazard and risk of damage).
- Fix USB-Box to the table or on the ground;
- Protect Ethernet-cables between trampoline and judge's table (for example: lay under mats and flooring).

2 Qira software installation

Note: This user guide is written for Qira V2.1.x. Some features may be similar in other versions. The most recent Qira software can always be downloaded from the Eurotramp website, under the following link: https://www.eurotramp.com/en/products/hdts/downloads

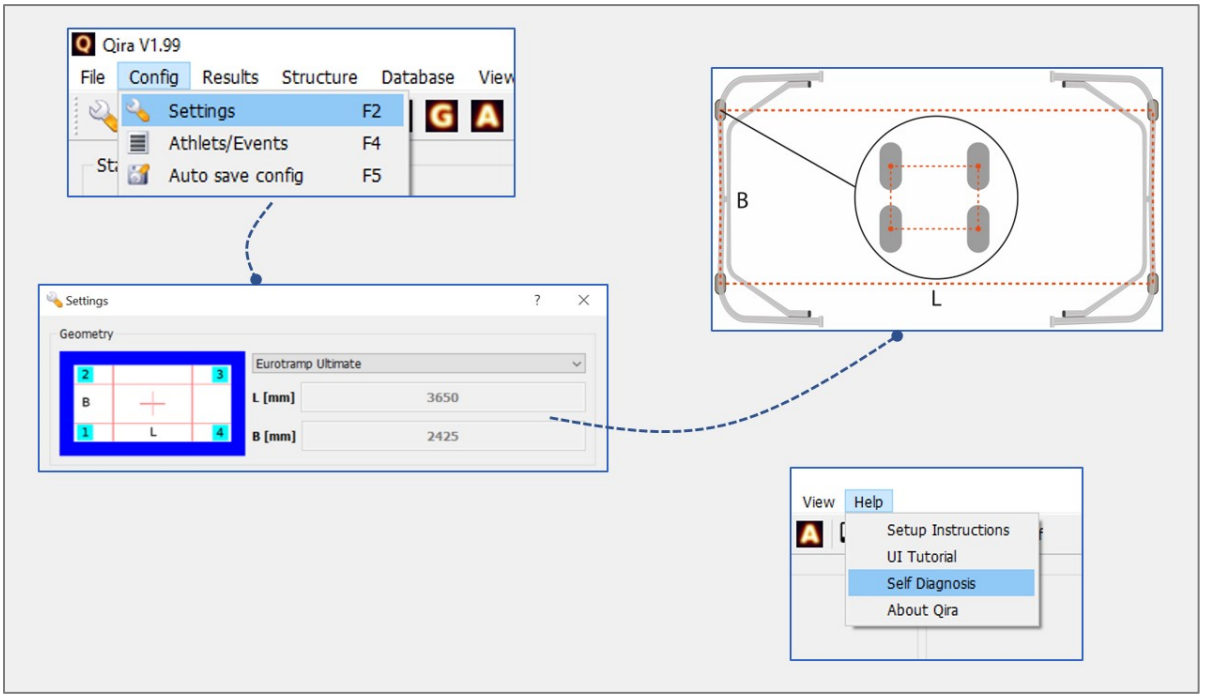


The software can be obtained from USB flash drive or via download from the Eurotramp website (double-check to ensure that the most recent version is used).

Start Installer by double-clicking the setup file (setupQiraV2.1.x.exe).

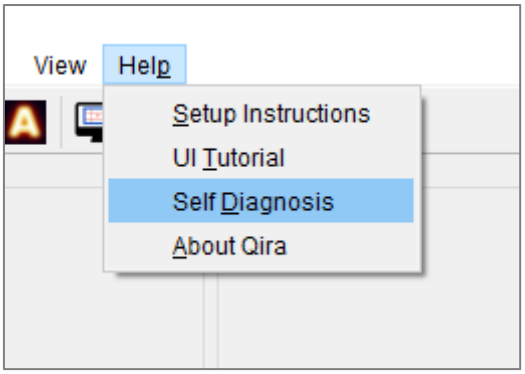
We recommend to create a desktop icon.

The setup of the HDTS system is complete. Make sure to select the correct trampoline brand and model in the Settings menu. If the trampoline you are using is not listed, enter the distances between midpoints of the floor protection of your trampoline. Finally, continue with the self-test to ensure the system's function.



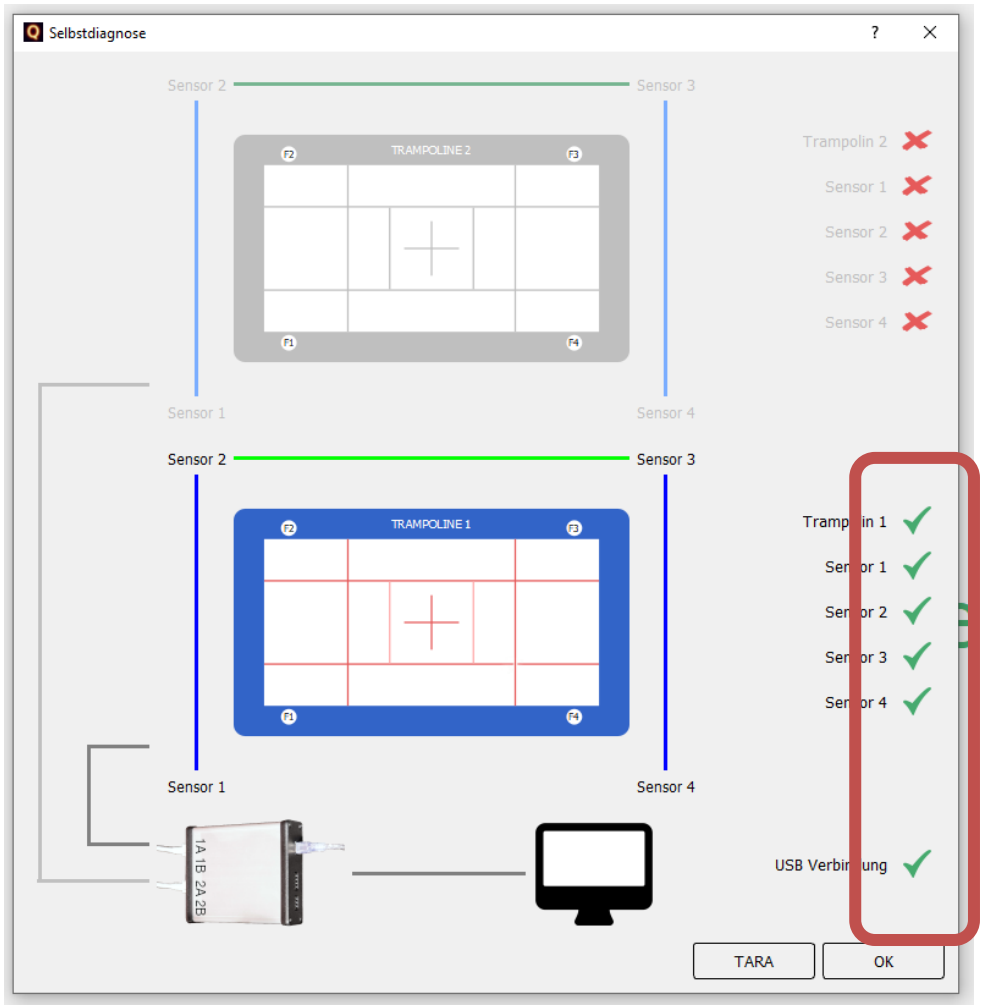
3 Self Diagnosis

Checking the system



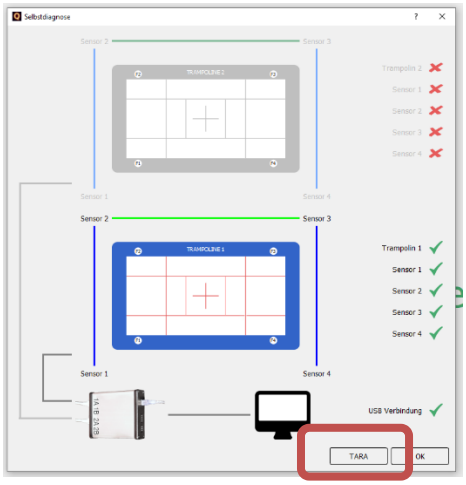
- Follow the instructions above to set the system up
- Start the Qira software and run the self-diagnosis from the help menu

- The self-diagnosis window shows the connections (wiring) of the current setup: trampoline 1, or 2, or both

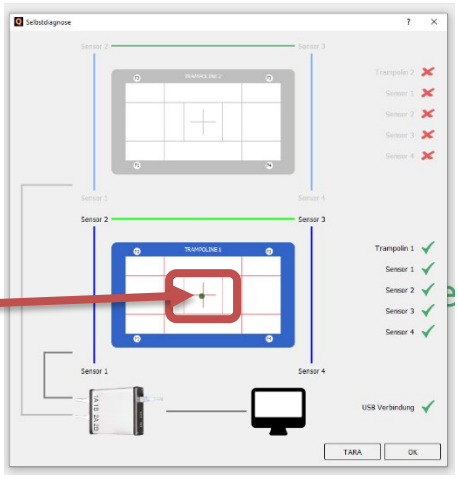


- Ensure that all sensors and the HDTS master box are connected (check marks) – fix the wiring, if needed. In the Figure, the system is only set up for trampoline 1.
- **NOTE**: If you cannot see the “TARA” and “OK” buttons, then the screen resolution of your PC is too low – try to increase it or consider using a different PC

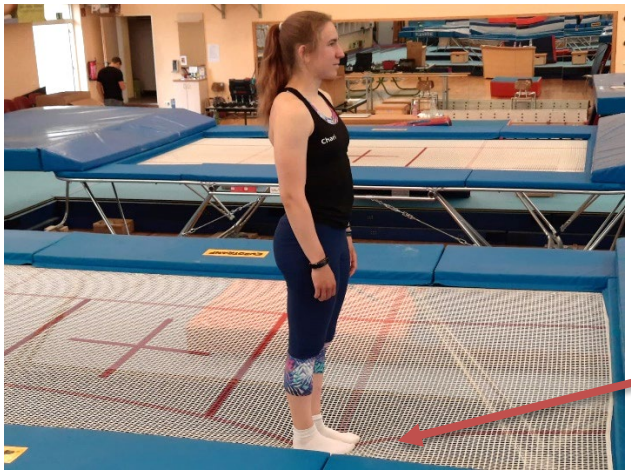
- Start the diagnosis by calibrating the system: ensure that nothing sits on the trampoline (including the safety mat), then press the “TARA” button

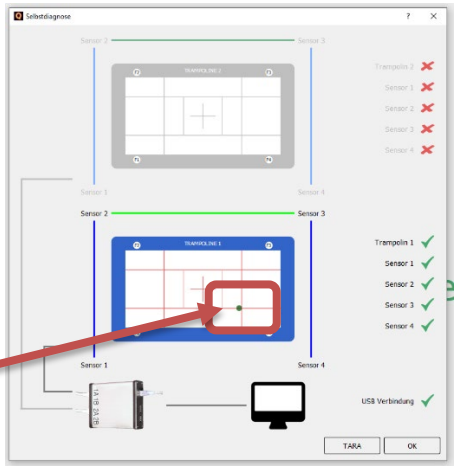


- Once the calibration is done, ask a volunteer to stand(!) on the trampoline. The volunteer should stand exactly in the middle of the trampoline and move as little as possible (no bouncing).
- Compare the volunteer’s position visually with the position shown in the self-diagnosis window to ensure that both match



- Continue by asking the volunteer to stand on the intersection of the lines on the trampoline. Again, compare the position of the volunteer with the one shown in the self-diagnosis window.





- Repeat the process for all four intersections of the lines
- Repeat the process for the other trampoline

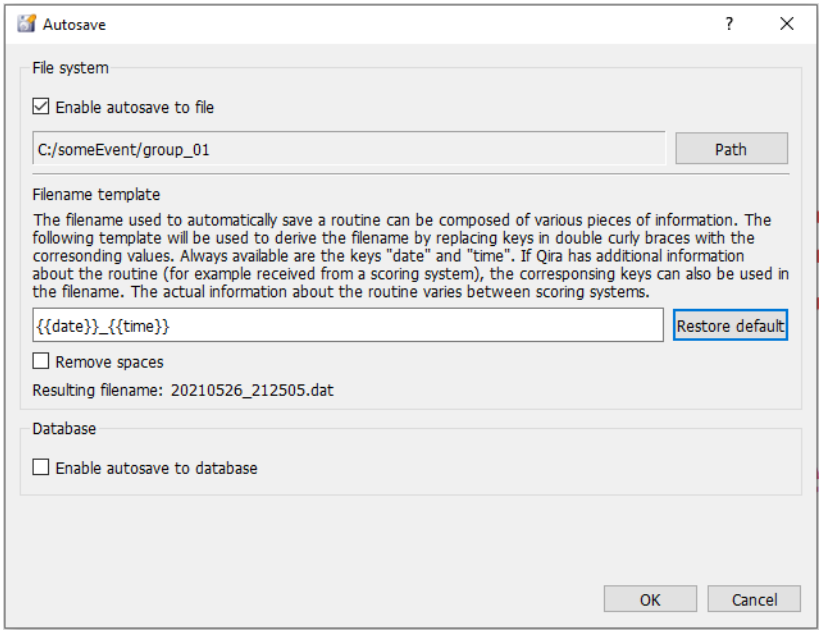
Troubleshooting

- If check marks are missing, double check all the wires
- If the position on the trampoline and the position in the self-diagnosis dialog do not match, try to re-calibrate the system by clicking the “TARA” button (ask the volunteer to leave the trampoline first). It is OK for the position to be slightly off (by a few centimeters) because the system measures the center of gravity which does not always match the visual impression of the volunteer’s feet.
- If the position is still off, consider replacing a sensor (or all sensors) if possible
- If the position is still off, contact us: hdts@eurotramp.com

4 Best practices for competitions

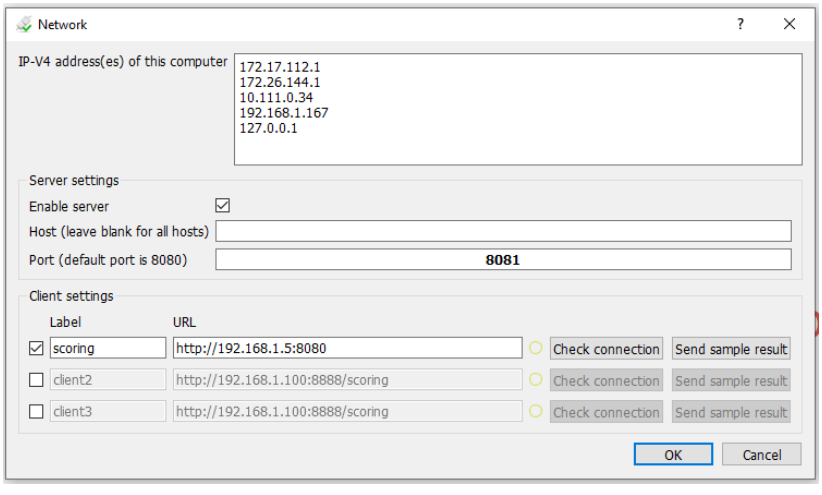
Autosave to file

- Enable the autosave function to automatically save all routines to files
- In the menu: Config -> Autosave config
- Use at least the current date and time in the filename to later identify routines
- Use different directories for different competitions/groups/finals to further organize the files
- Add additional gymnast/routine information to the filename, if available (see below)



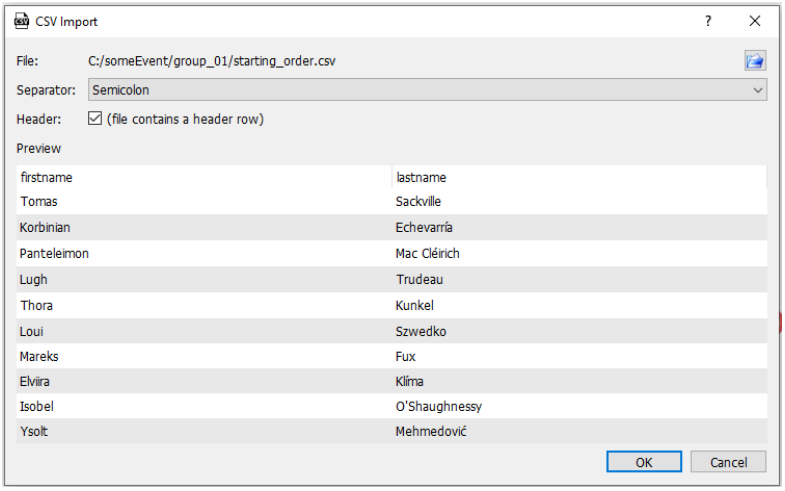
Connect Qira to the scoring system

- If possible, directly connect Qira with the scoring system using the programmatic interface
- The scoring system can send additional gymnast/routing information to Qira, for instance, the name of the gymnast
- Qira can send results directly to the scoring system, which prevents human error
- The information provided by the scoring system can be used as part of the filename



Import a starting list from file

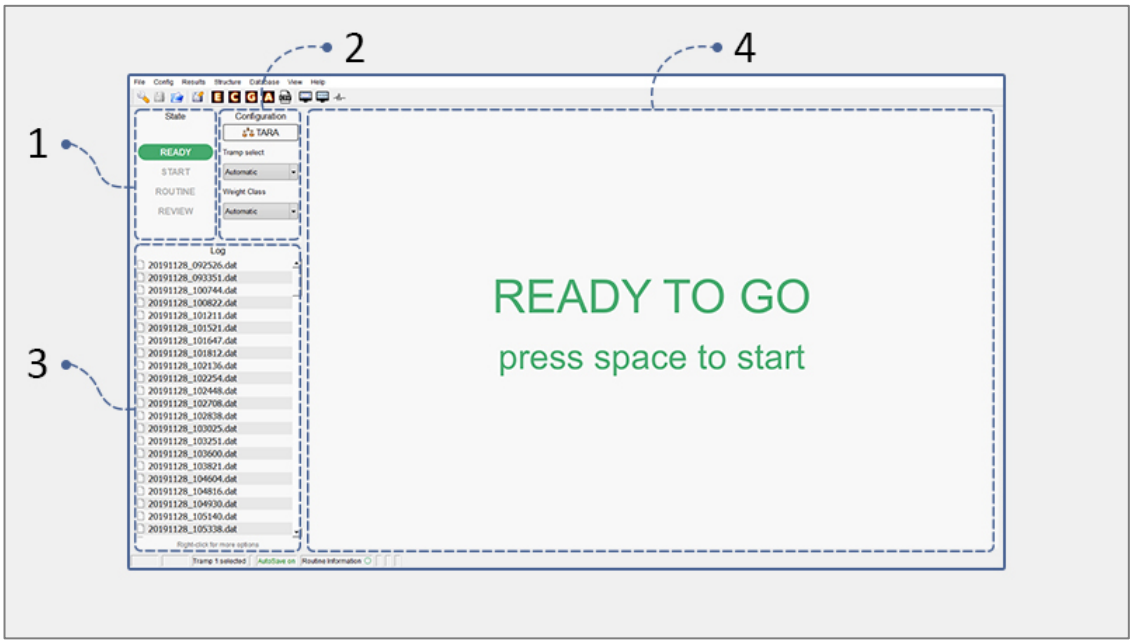
- If (and only if) a direct connection to the scoring system is not possible, it may still be possible to import a starting list from file
- The file needs to be in the csv format (comma separated values), that is, each line contains all available information for a gymnast/routine separated by comma (technical note: use UTF-8 as file encoding)
- Qira cannot directly import Excel files, however Excel can export spreadsheets to the aforementioned csv format
- The additional information provided by the imported starting list can be used to compose the filename for the autosave function (this helps finding a given routine later on)
- Best practice is to have separate lists/files for each starting group (or final)
- **NOTE** Do not use the file import AND a network connection to a scoring system that sends additional information as this will lead to unexpected behavior
- **NOTE** The starting list is not kept permanently in Qira. Closing the application will remove the current starting list. The list can be imported again to continue the competition



Autosave to database

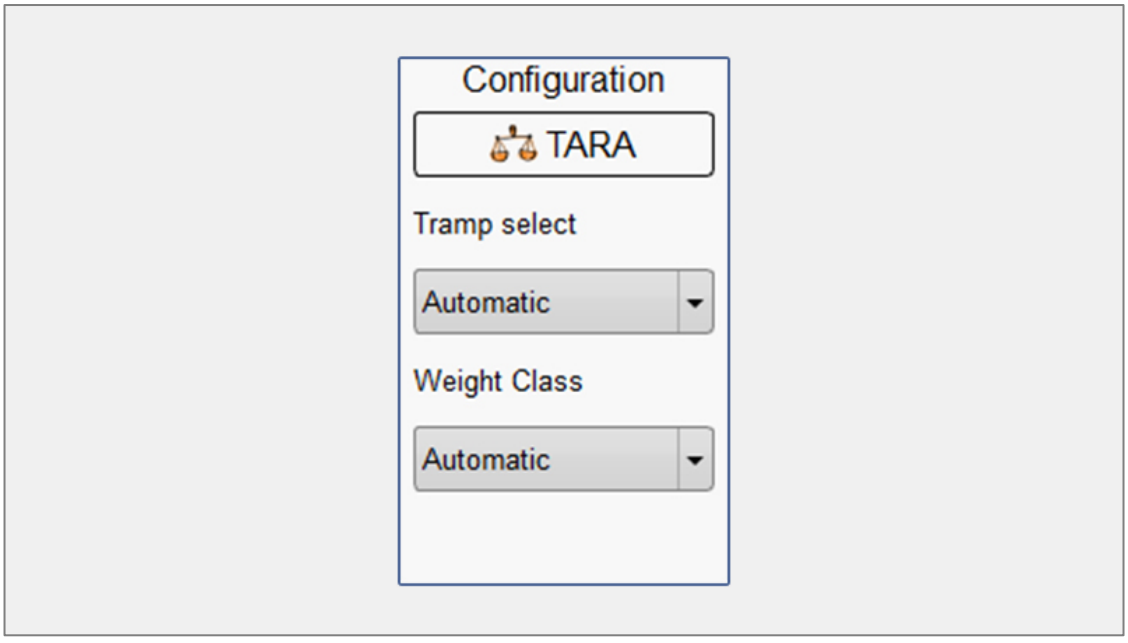
- The existing database function is intended for training with the HDTS system and is NOT recommended to be used in a competition
- Data input, usability, and robustness have known shortcomings that make this function less suitable for the stressful competition environment

5 User interface



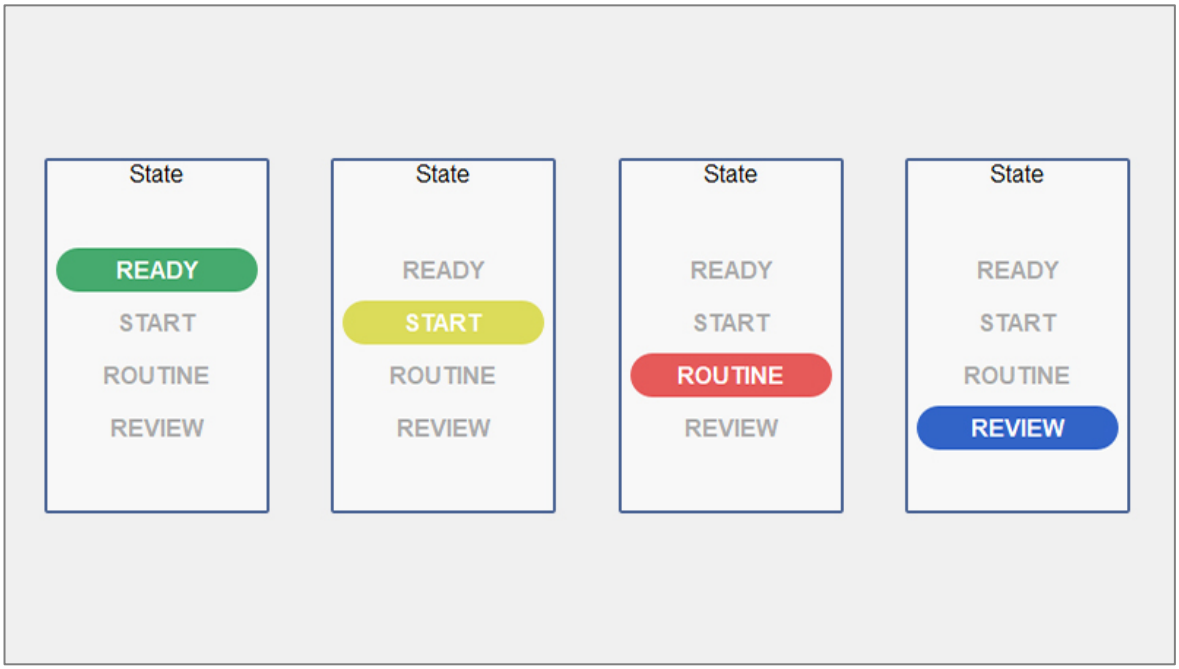
The application is structured in four major areas:

1. Current state
2. Configuration
3. Competition organization
4. Results



The configuration area has a button to calibrate the system (TARA). The system should be calibrated once after setting up the system and with no additional weight on the trampolines. Afterwards, the software measures its state independently and adjusts the calibration if needed.

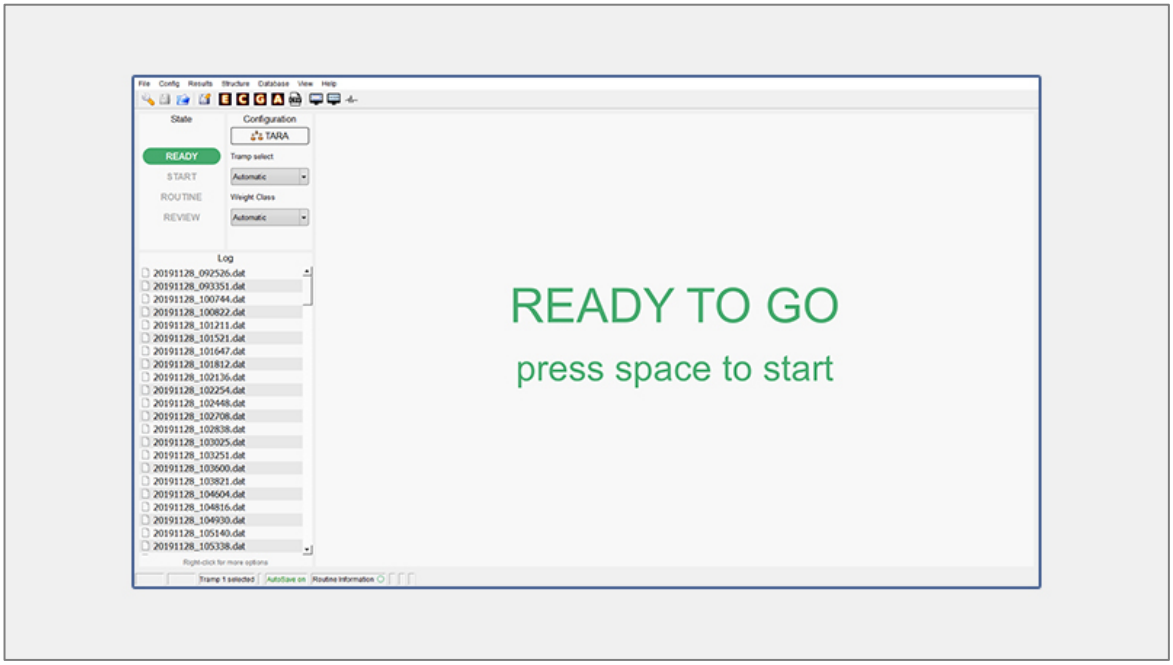
Furthermore, the configuration area can be used to select the trampoline to use for measurements as well as the athlete´s weight class. It is recommended to use the automatic detection of both parameters.



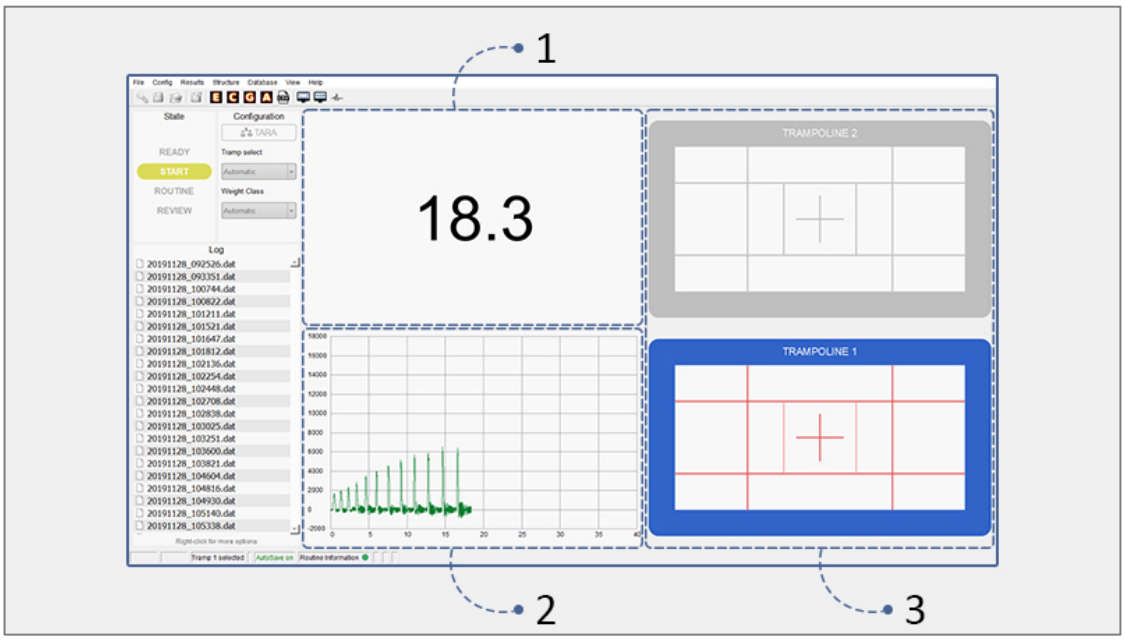
The current state during normal operation mirrors the phases of a trampoline routine.

- Measuring can be started in the state **READY** – the athlete has not yet started.
- The athlete gains height before showing his routine in the state **START**.
- The software measures and evaluates horizontal displacement as well as time-of-flight or synchrony in the state **ROUTINE**.
- The **REVIEW** state is intended for checking and approving results.

Press space to iterate between the four states.



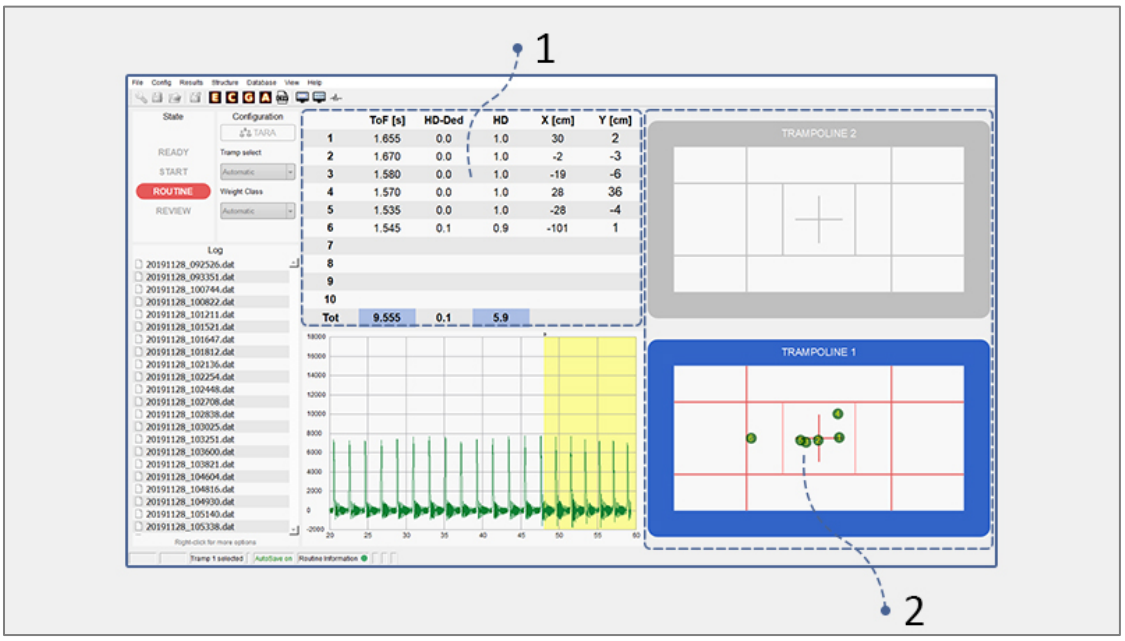
The state **READY** signals that the software is ready to start a measurement. The transition to the state **START** is executed as soon as the athlete gets a signal from the chair of the judges' panel to start the routine.



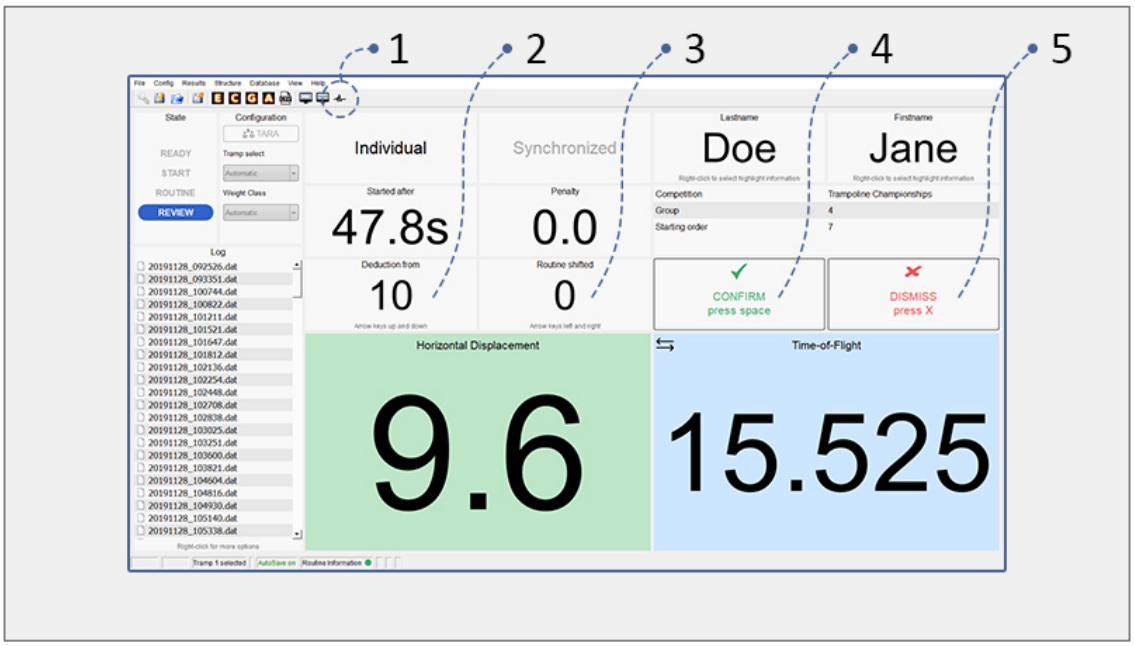
The athlete gains height before the actual routine in the state **START**.

Multiple pieces of information are shown in this state. A clock shows the time spent before the athlete starts the routine **(1)**. A chart shows current force values of the force plates – a landing in the trampoline should lead to a spike in the chart **(2)**. The trampolines in the application show which trampoline is currently used for the measurements **(3)**. The automatic trampoline detection takes up to five seconds to switch the active trampoline.

The transition to the next state is initiated by pressing the spacebar as soon as the athlete shows the first element of the routine.



The athlete performs his routine in state **ROUTINE**. The landings are recorded in the table during the routine **(1)**. Additionally, the landing positions are shown in the trampoline **(2)**. The measurement is ended after the last landing or when the athlete interrupts the routine by pressing the spacebar. The software prevents routines with more than ten elements, hence it is not possible to inadvertently end the routine “too late”.

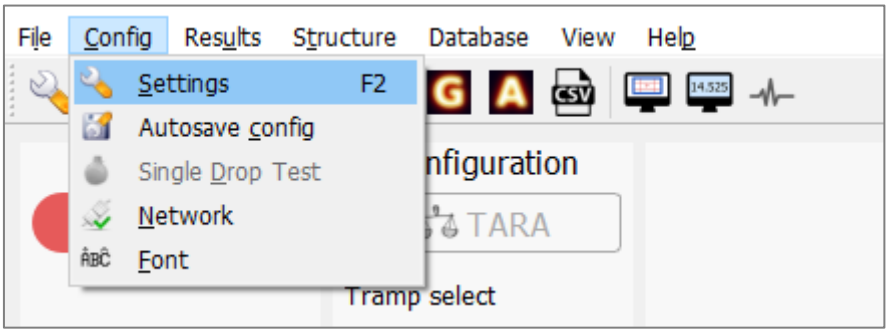


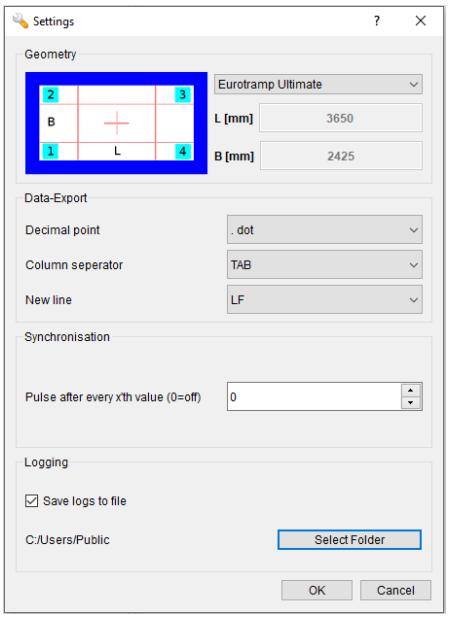
After the routine, the results are presented in an overview in the state **REVIEW**. It is possible to go back to the detailed result view by pressing the D key on the keyboard or by clicking the corresponding item in the action bar **(1)**. Furthermore, it is possible to shorten or lengthen a routine by pressing the up and down arrow keys **(2)**. It is possible to shift the whole measurement, should it not be aligned correctly to the athlete's routine (e.g., if it was started too late). This is done with the left and right arrow keys **(3)**. When all results are correct, they can be confirmed by pressing the spacebar **(4)**. Confirmed results can be shown on a second screen in a separate window and are stored (if configured). Should the results be wrong, they can be dismissed by clicking the button or by pressing the X key **(5)**. Either confirming or dismissing the results leads to a transition to the READY state.

All necessary steps to measure a routine are covered. The next chapters describe advanced functions like configurations, save-modes and structuring a competition.

6 Configuration

a) Settings (Shortcut: F2)





Geometry

Select the correct trampoline or enter distance between midpoints of floor protection

Data-Export

Specific configuration for “Auto-Save function (File)”

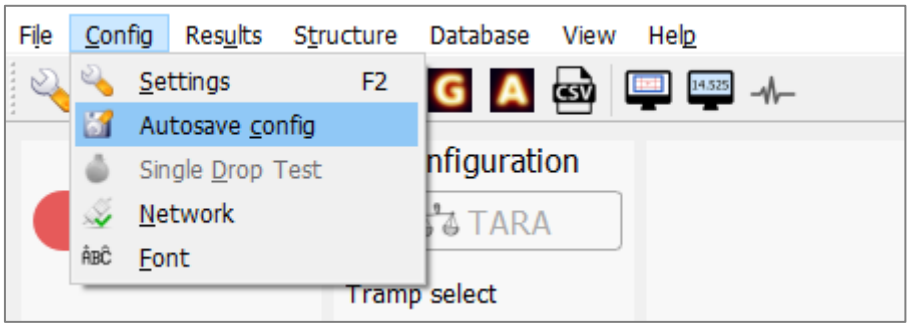
Synchronisation

Function for system development

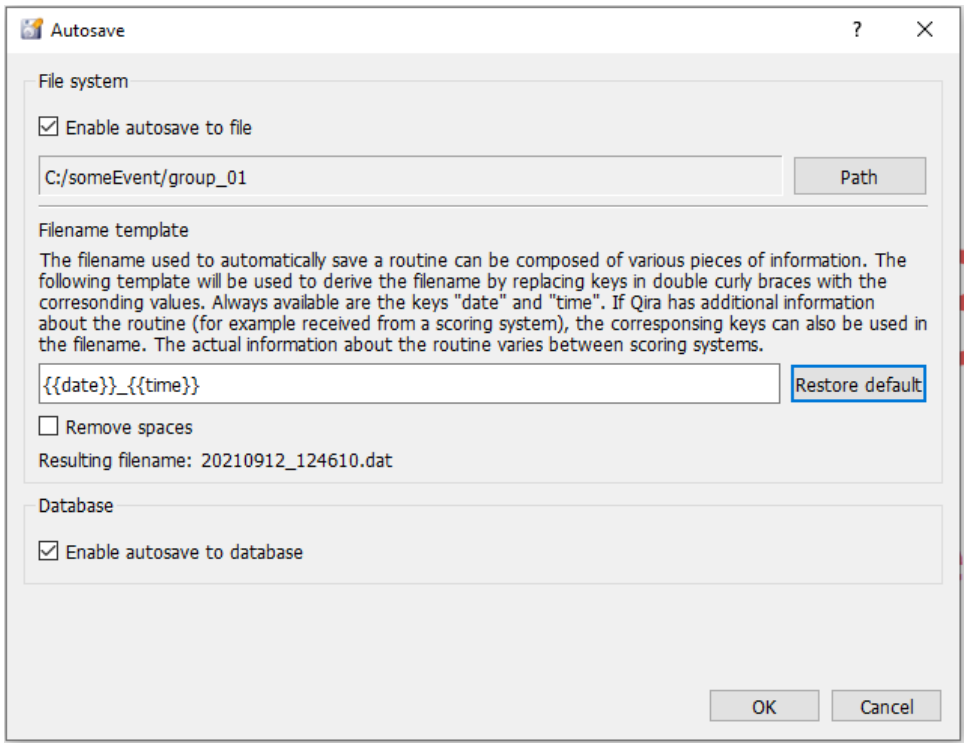
Logging

Creates an event log in the file system.

b) Autosave config (Shortcut: F5)

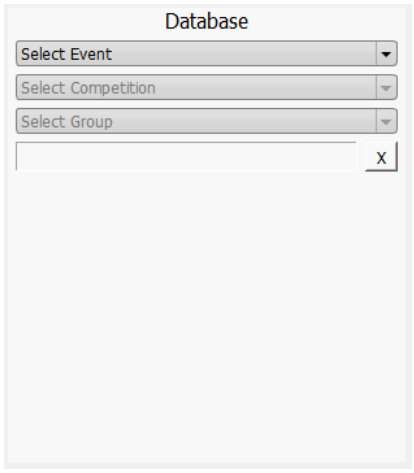


Autosave to file system



Enable the Autosave to file system function and set a storage path for the result-files. The automatically generated filename can be composed of different pieces of information such as the current date and time.

Autosave to database



For more information and a guide how to set up the structure, see chapter 8 “Structure - Database” and chapter 10 “Database”

c) Single Drop Test

Function for system development – Records a single landing position

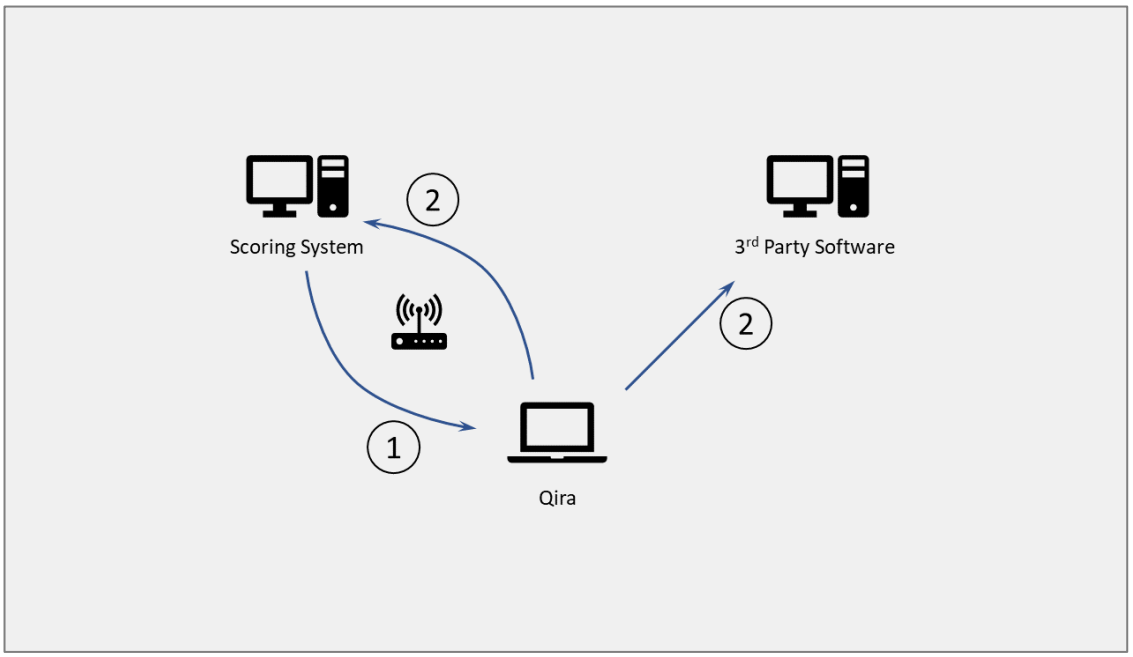
d) Network

Settings for network communication. For more information, see chapter 7 “Network”.

e) Font

Settings for font type and font size.

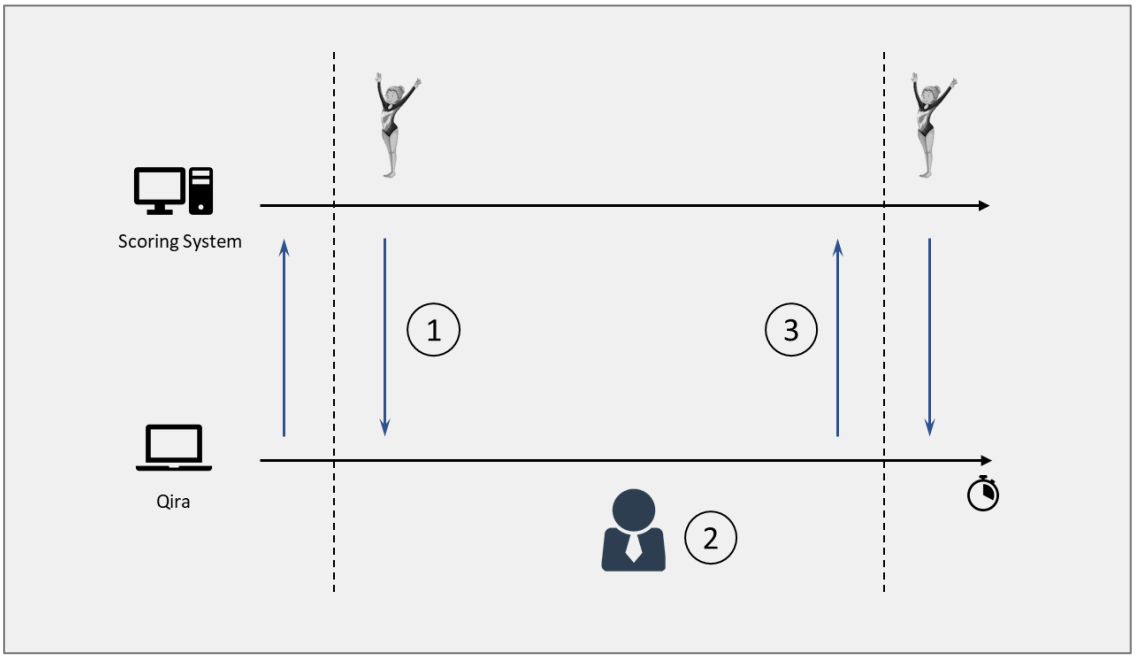
7 Network



Qira is able to communicate with scoring systems over a network. These instructions present an overview of the possibilities and required configurations.

Qira is equipped with two application programming interfaces (APIs) to communicate with scoring systems. Using the server interface, Qira receives information about the current routine, for example the name of the gymnast or the current competition. The exact information that is provided depends on the scoring system and can vary between different systems. Qira's client interface is used to send results back to the scoring system at the end of a routine. The results can furthermore be sent to additional third-party systems, for example to be displayed.

Technical details. The APIs use the https protocol and transmit data in the JSON format.



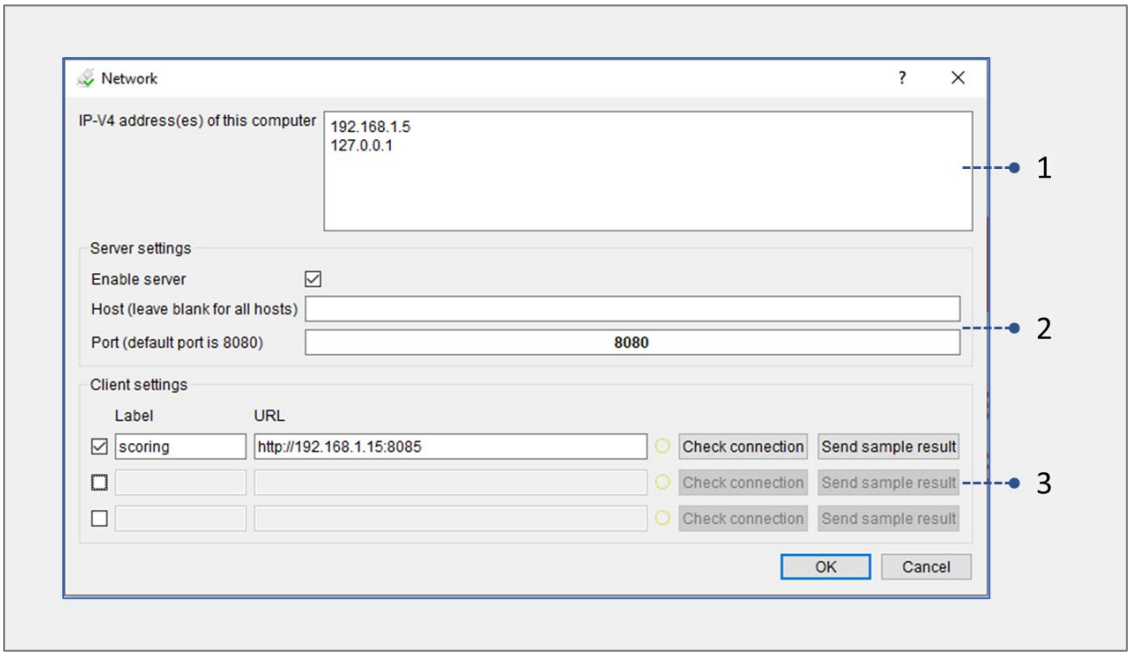
To correctly measure and transmit results, it is important to follow a certain order of events.

(1) The scoring system sends information about the routine as soon as the next gymnast is ready and selected in the system. Qira can receive the information in any of the phases “READY”, “START”, “ROUTINE”, and “REVIEW”.

(2) Once the routine has finished, the judge double-checks the results together with the provided information. After possibly modifying the results, for example to calculate the deduction from fewer than ten elements, the judge confirms the results.

(3) Qira sends the results back to the scoring system. Alternatively, it is possible to pull the most recent confirmed result from Qira but we recommend sending them to the scoring system to ensure the correct order of events.

These events repeat with the next gymnast who is ready and selected in the scoring system.

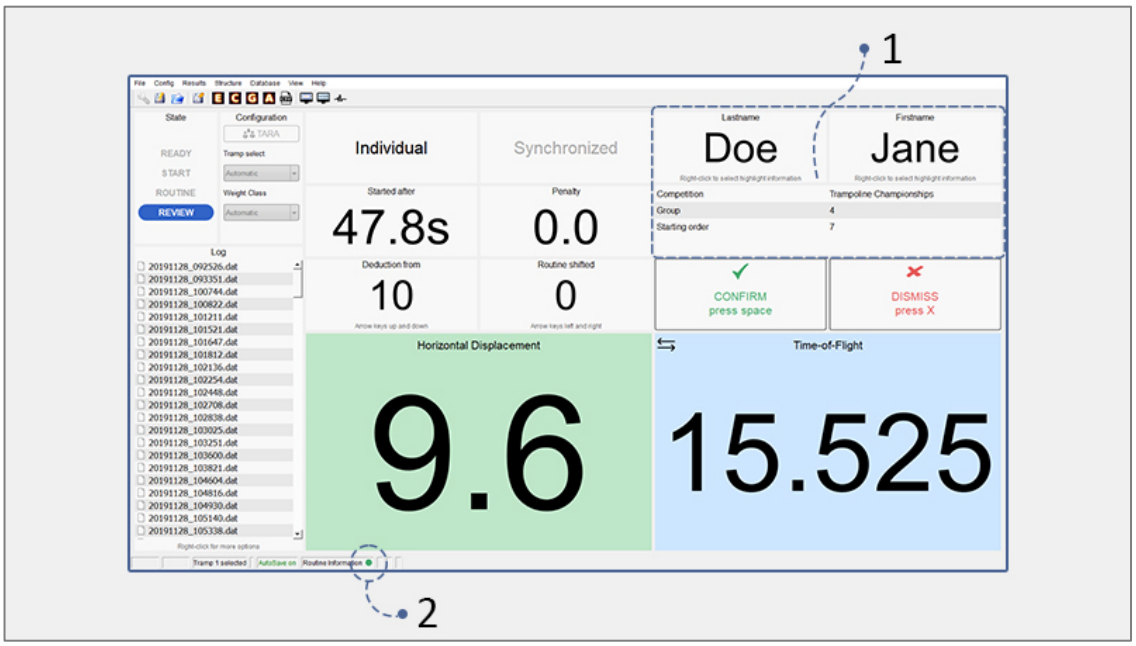


The network configuration dialog is used to set up client and server in Qira.

(1) The topmost area shows all IPv4 addresses assigned to this computer. This information cannot be changed here and is intended to help setting up the scoring system.

(2) The http server in Qira can be configured in the next section. The server can be activated or deactivated and certain parameters can be changed. The default values can in most cases be left unchanged.

(3) The bottom section in the dialog is used to configure up to three clients. Each client can independently be activated or deactivated. All active clients are used to send results at the end of a routine. A client’s configuration consists of a freely selectable label and the URL to the scoring system’s server. The buttons can be used to test the connection and send a sample result.

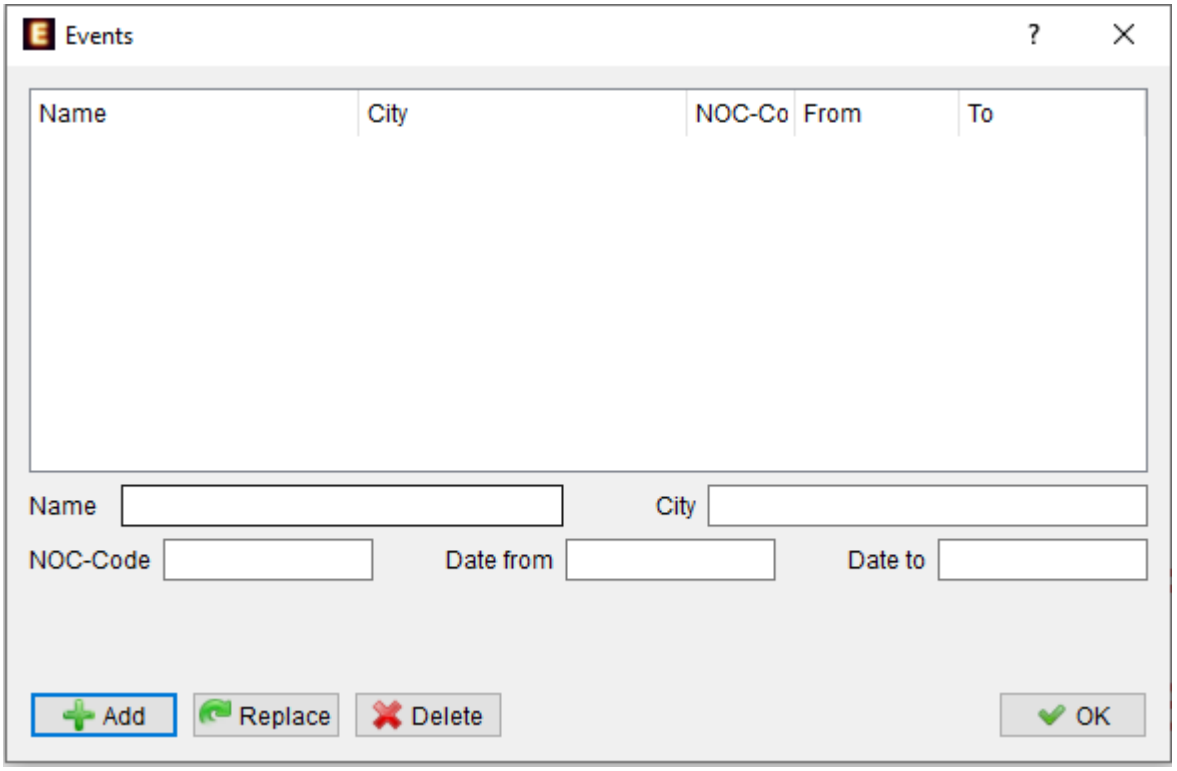


Information about a routine that Qira receives from a scoring system is displayed in the upper right quadrant of the result overview **(1)**. A table shows all received values in a concise format. Additionally, two of the values can be highlighted and shown separately. Given that the available information can vary between scoring systems, the judge has to pick the information to highlight by right-clicking in the respective areas of the result overview.
The status bar shows in different areas whether or not Qira has received routine information from a scoring system and whether or not the most recent result was successfully transmitted back to the scoring system **(2)**.

8 Structure - Database

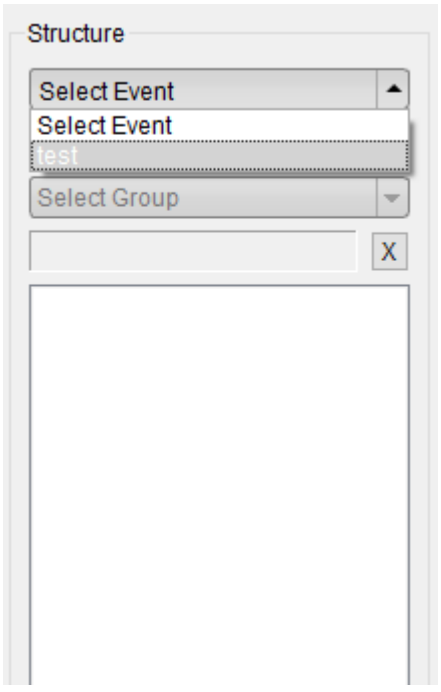
a) Create Event (Shortcut: CTRL+E)

- Confirm information-input with „Add“-button;
- Confirm changes with „Replace“-button;
- Delete incorrect input with „Delete“-button.

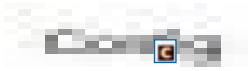


b) Select Event

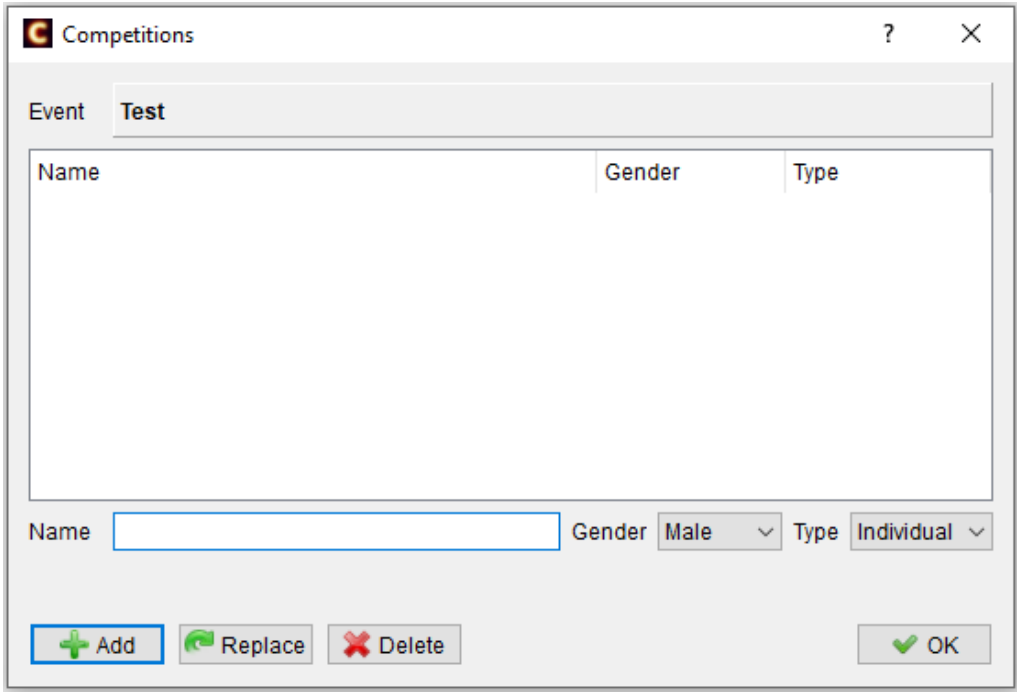
- Select an event in „Structure“.



c) Create Competition (Shortcut: CTRL+C)

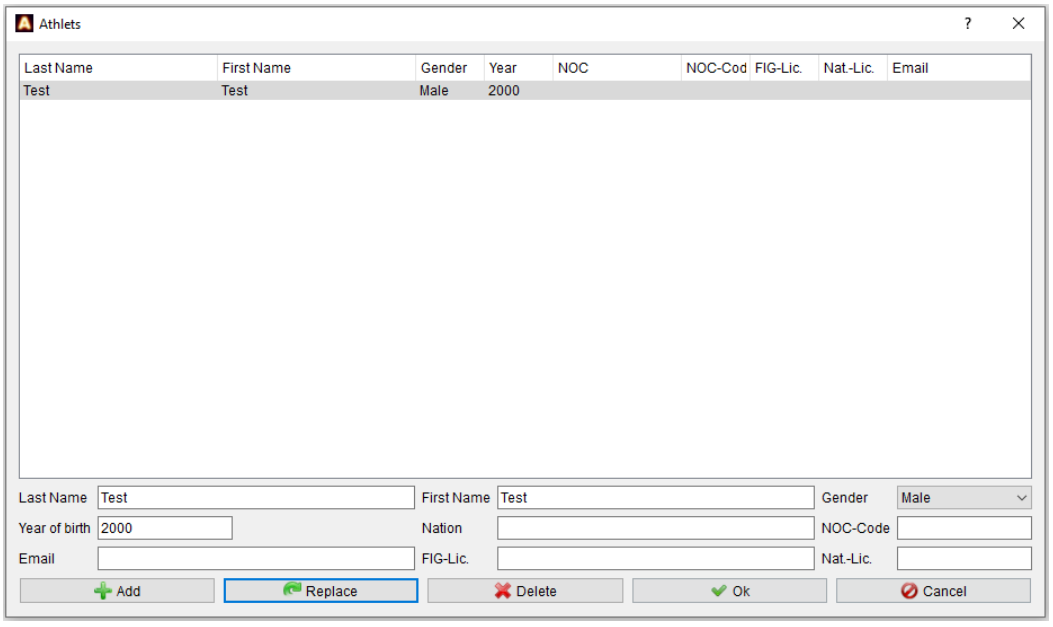


- Confirm information-input with „Add“-button;
- Confirm changes with „Replace“-button;
- Delete incorrect input with „Delete“-button.
- Select gender and type of competition



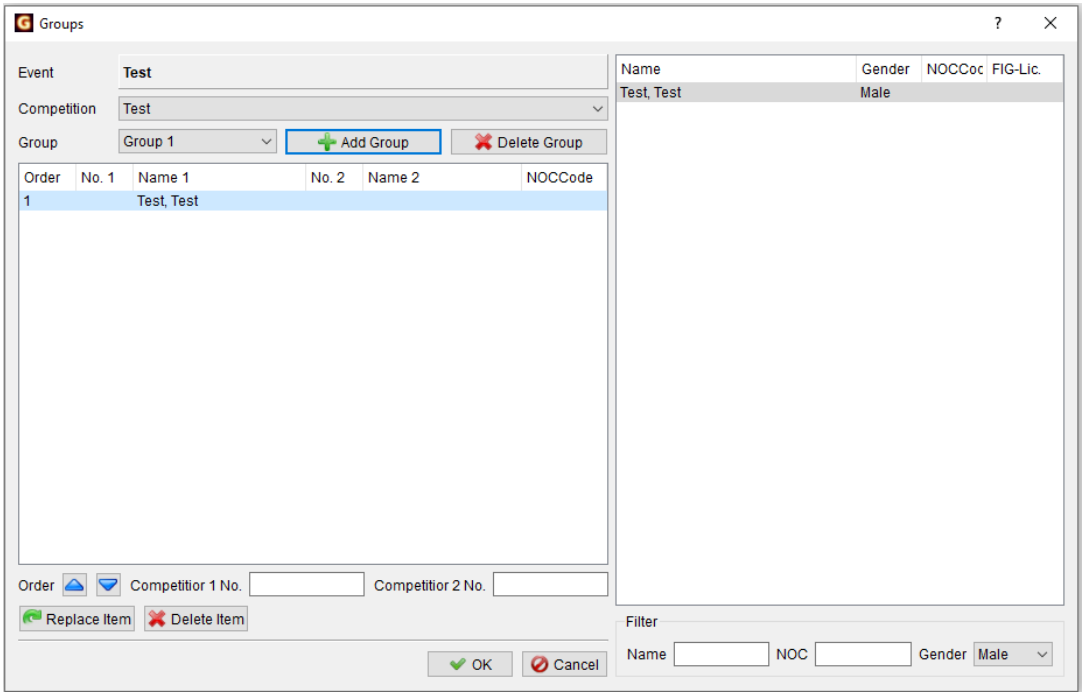
d) Create Athletes (Shortcut: CTRL+A)

- Create athlete with „Add“-button;
- Create next athlete;
- Confirm changes with „Replace“-button;
- Delete athlete with „Delete“-button.

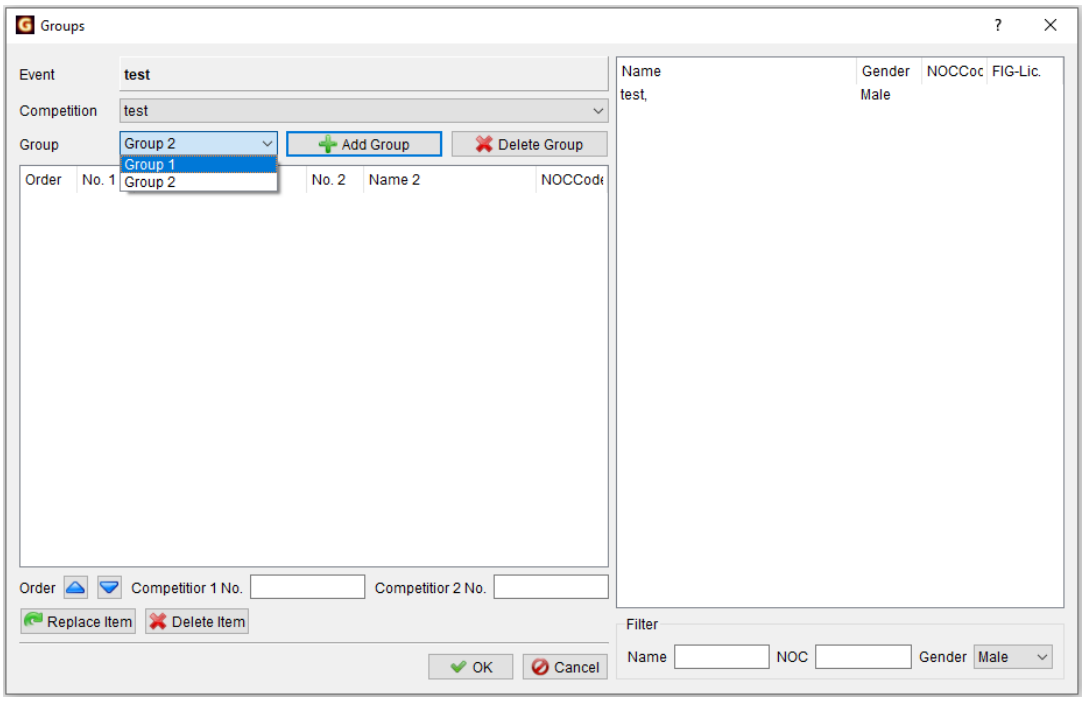


Create Groups (Shortcut: CTRL+G)

- Add group with „Add Group“-button;
- Delete incorrect input with „Delete Group“-button.

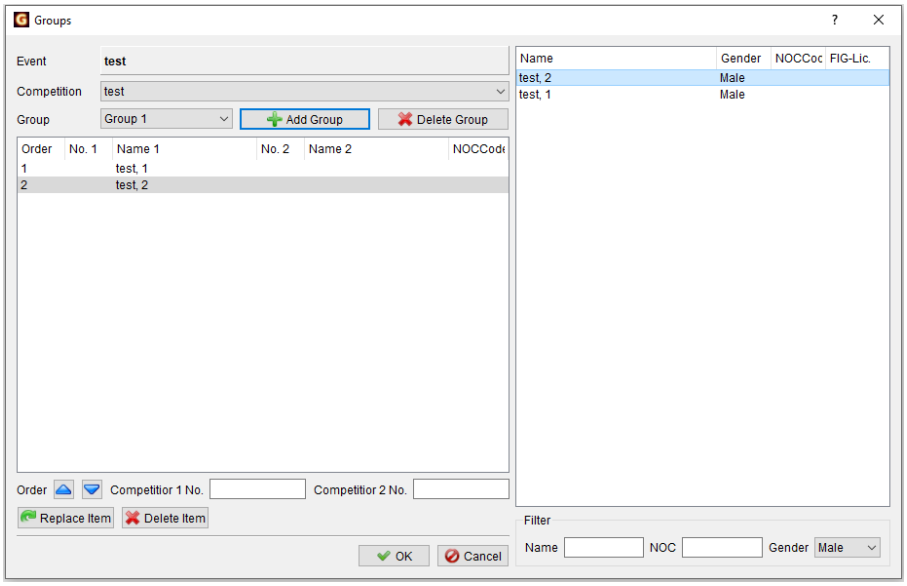


- Select group from dropdown-menu „Group“.



Fill groups with athletes:

- Select athletes from sidebar with double-click;
- Replace athlete with „Replace Item“-button;
- Delete athlete with „Delete Item“-button;
- Confirm with „OK“-button.

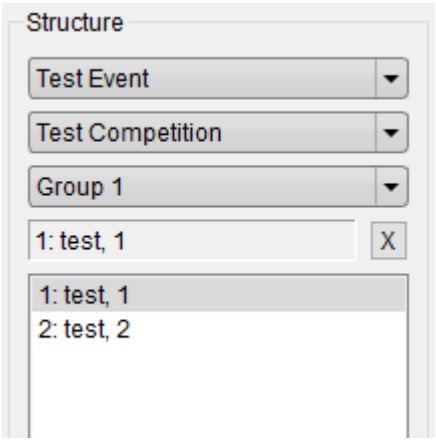


OPTIONAL:

- Filter athletes in sidebar (Name/NOC/Gender).

Store routine in database

- Select event, competition, group and athlete
- Name of athlete is shown on the selected trampoline.
- Record routine for this athlete
- „X“ beneath the name cancels athlete;



Show results afterwards

- Double click on athlete in sidebar;
- Single click on routine in sidebar.

9 Structure – CSV File

Overview

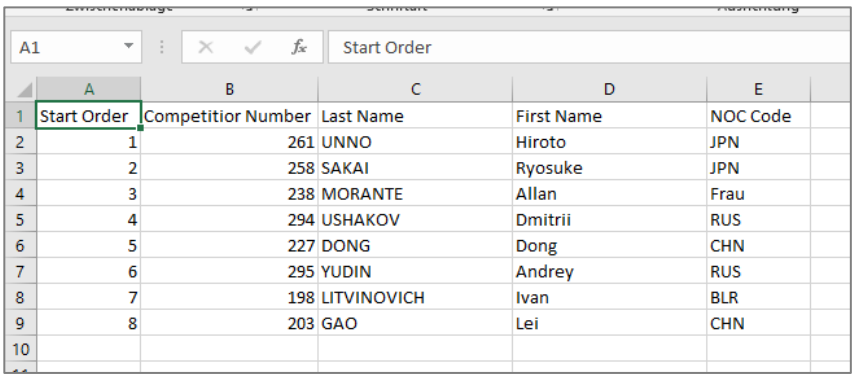
- Qira can import a starting list from a file
- The information from the list can be stored together with the routine
- Thereby, a saved routine/file can unambiguously be linked to a gymnast/group/…
- Qira DOES NOT impose any requirements/specifications on the file content
- Specifically, there are no required columns
- Any information at hand (or exported from a scoring system) can be used as long as it complies to the csv file format
- Best practice is to have a separate list by group/semi/final
- Qira does not keep starting lists permanently, that is, closing Qira will remove the starting list (it can easily be imported again)

File format

- Qira can import files in csv format, that is, comma separated values
- Qira supports the following column separators: Comma, Colon, Semicolon, Pipe, and Tab
- UTF-8 is supported and recommended as file encoding
- Qira supports csv files with and without a header line
- The file may not contain any other information/line besides a header line and the actual starting list

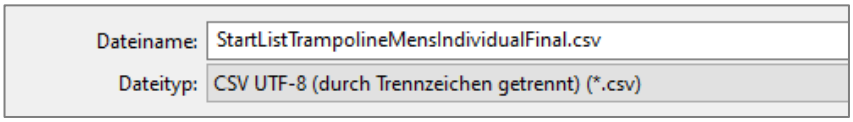
Excel import

- Qira cannot directly import Excel files
- However, Excel can export spreadsheets to the aforementioned csv format
- In Excel, click “File” -> “Save as…”. Select csv as file format.
- Example:

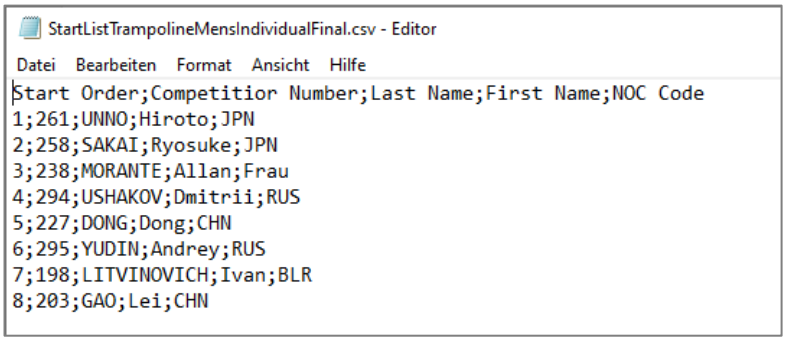


	A	B	C	D	E
1	Start Order	Competitior Number	Last Name	First Name	NOC Code
2	1	261	UNNO	Hiroto	JPN
3	2	258	SAKAI	Ryosuke	JPN
4	3	238	MORANTE	Allan	Frau
5	4	294	USHAKOV	Dmitrii	RUS
6	5	227	DONG	Dong	CHN
7	6	295	YUDIN	Andrey	RUS
8	7	198	LITVINOVICH	Ivan	BLR
9	8	203	GAO	Lei	CHN
10					

- Save as…

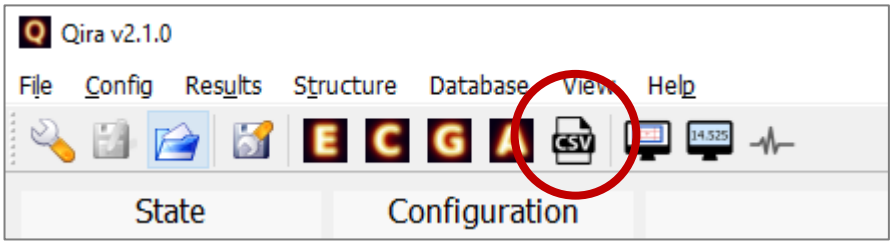


- Resulting csv file (opened in an editor)

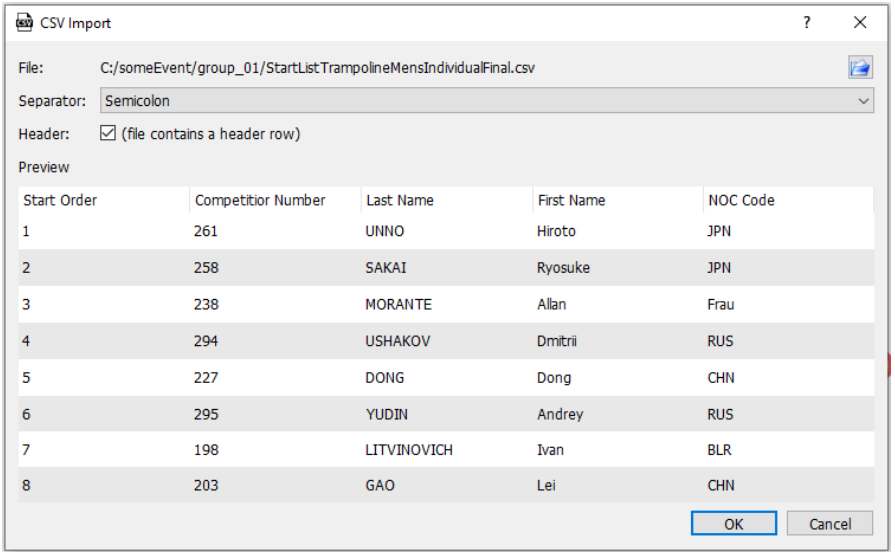


Workflow

- In Qira, select “Import CSV file” from the “Structure” menu or the action bar

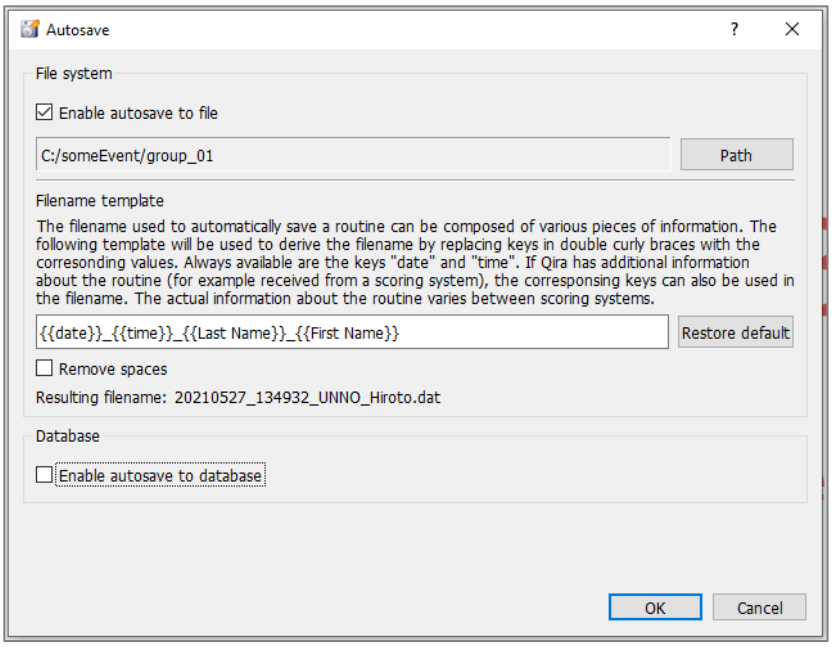


- Open the csv file via the dialog and set the appropriate options

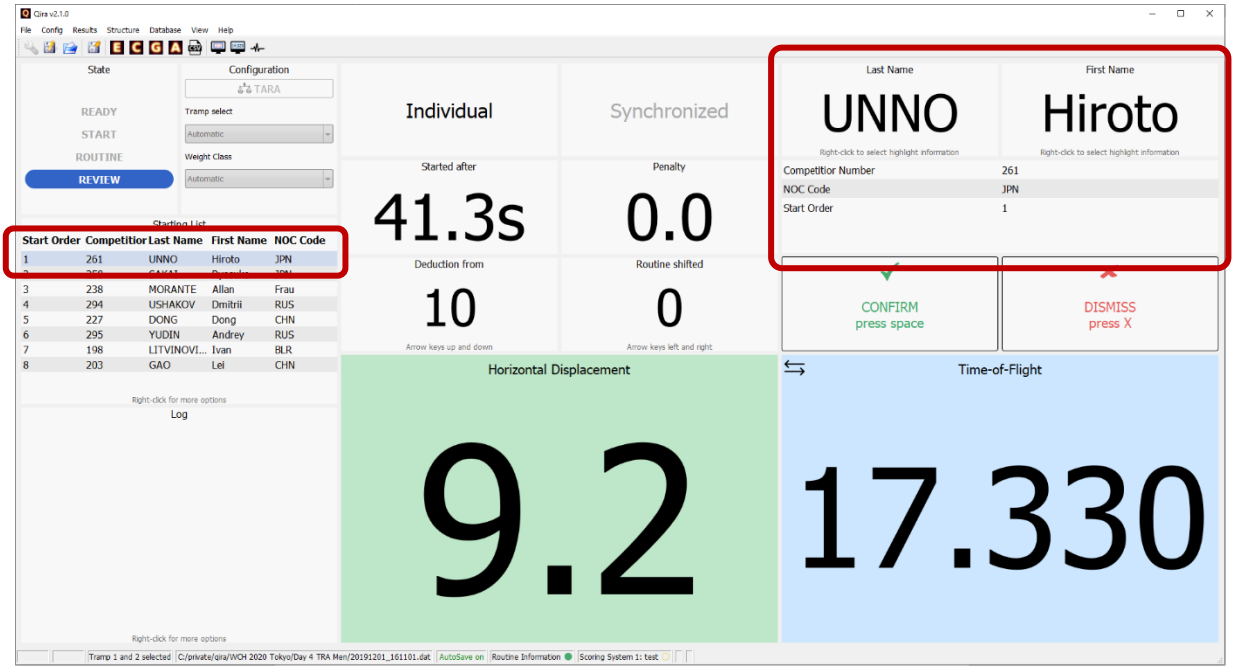


- Once you click “OK”, the starting list appears in Qira.

- Open the autosave configuration via the menu: “Config” -> “Autosave config”
- The filename template can be used to incorporate information from the starting list in the filename that is used to automatically save a routine. All column headers can be used in the template
- For example, given the above shown starting list, you can use the following template
  - {{date}}_{{time}}_{{Last Name}}_{{First Name}}
- For Hiroto UNNO, the routine will then be saved to the following file (depending on date and time)
  - 20210527_134932_UNNO_Hiroto.dat

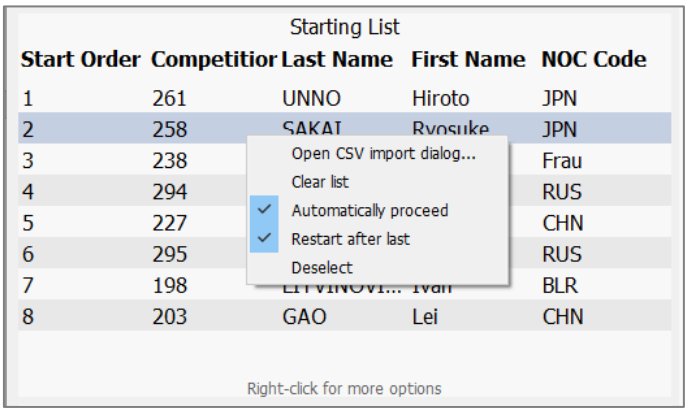


- Before (or after) a routine is recorded, the corresponding gymnast/pair must be selected in the starting list
- The information about the gymnast/pair also shows up in the result overview



- Confirming the routine will result in a file that is automatically saved to disk

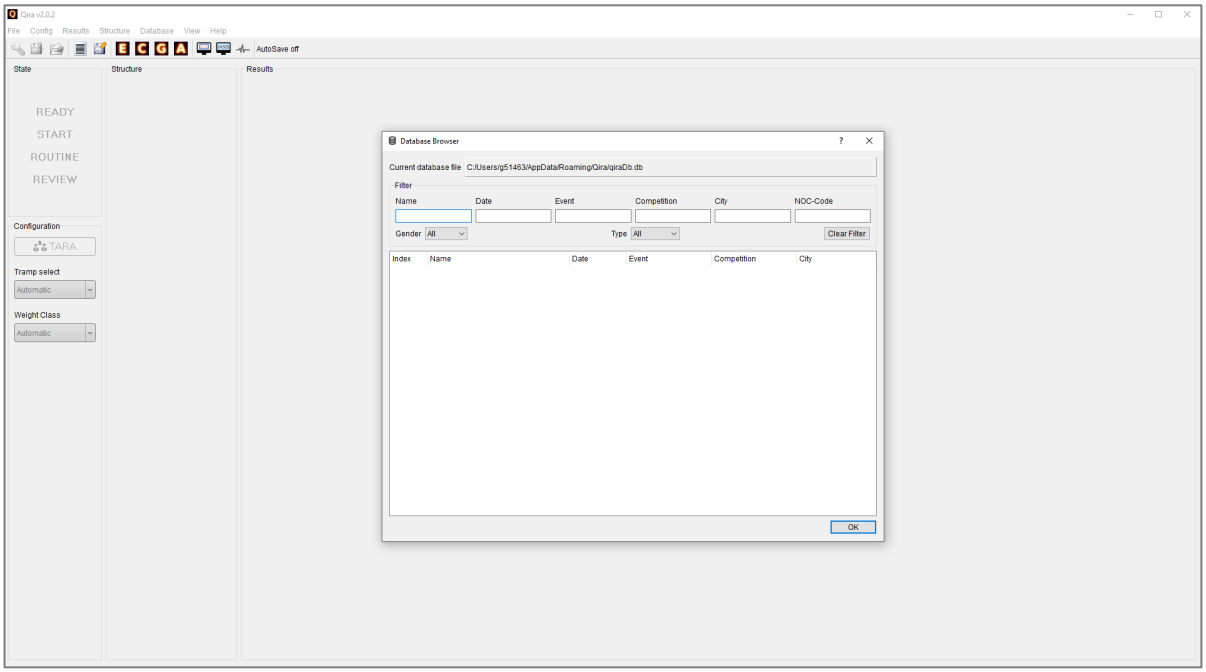
- Additional options for the starting list are available in the context menu



10 Database

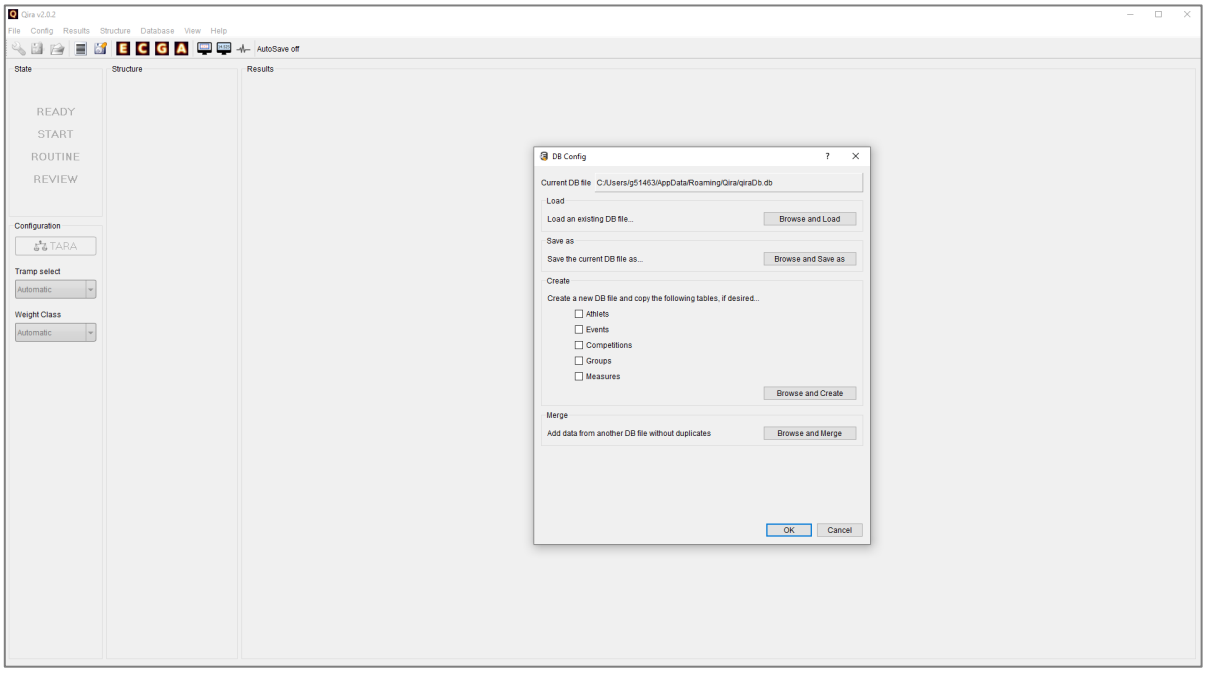
a) DB Browser

- Shows current database file and path;
- Allows search with filters of current database file.



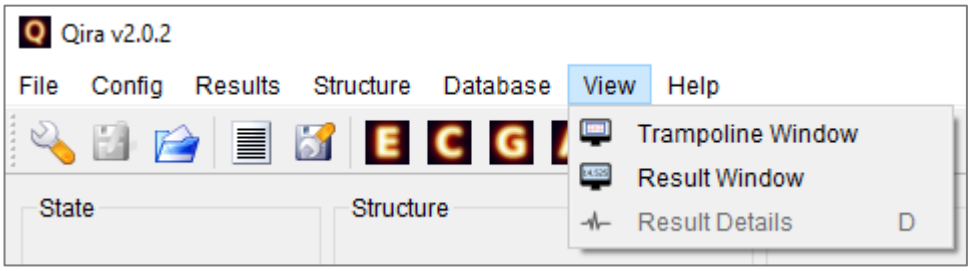
b) DB Config

- Shows current database file and path;
- Browse and load another existing DB file;
- Browse and save the current DB file
- Create a new DB file and copy selection of tables of existing DB file;
- Merge current and another DB file without a duplicate

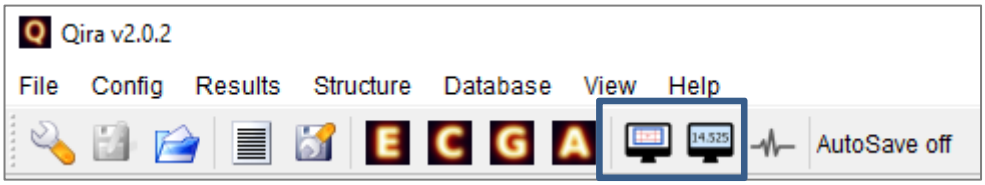


11 Additional features

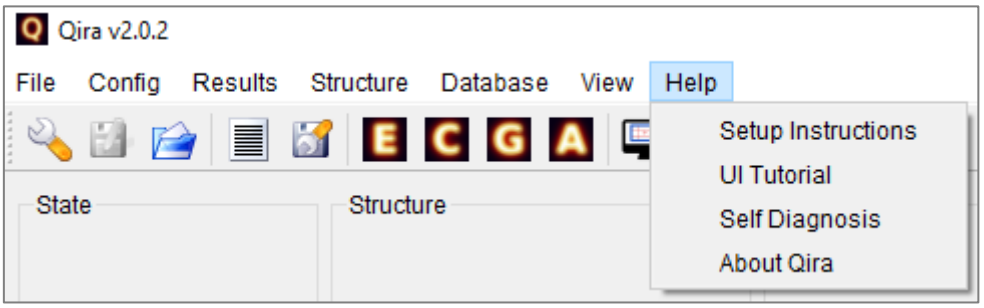
a) View



- Opens a window for horizontal displacement and/or results
- Recommended to use in fullscreen for a second and third display
- Shortcut-Icon in toolbar



b) Help



Re-open instruction-dialogs, start self-diagnosis and learn about Qira

- About Qira contains the Version, Date and build-number. This might be useful for troubleshooting and service
- Contact information for technical issues: hdts@eurotramp.com

If you have any questions, contact us any time:

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FÉDÉRATION INTERNATIONALE DE GYMNASTIQUE

Certificate

accorded to / *accordé à*

EUROTRAMP-TRAMPOLINE Kurt Hack GmbH

We hereby confirm that the apparatus mentioned below adheres to the FIG norms and may therefore be used at all FIG events, as well as those of its Continental Unions and Affiliated Federations

Nous attestons que les appareils de gymnastique mentionnés ci-dessous répondent aux exigences de la FIG et peuvent etre utilisés dans toutes les manifestations de la FIG, ainsi que celles des Unions Continentales et Federations Affiliées

HDMD

Apparatus ID: 269

This Certificate is valid until / *Ce Certificat est valable jusqu'au*

December 31st, 2022

FEDERATION INTERNATIONALE DE GYMNASTIQUE

Lausanne, December 31st, 2018

Morinari Watanabe
President

Nicolas Buompane
Secretary General